Preface

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Version 1.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilieur du Canada.

About the Manual

The manual consists of the following:

Chapter 1

Introducing the Motherboard

Describes features of the motherboard.

Go to ⇨ page 1

Chapter 2

Installing the Motherboard

Describes installation of motherboard components.

Go to ⇨ page 7

Chapter 3

Using BIOS

Provides information on using the BIOS Setup Utility.

Go to ⇨ page 25

Chapter 4

Using the Motherboard Software

Describes the motherboard software

Go to ⇨ page 43

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Chapter 1
Introducing the Motherboard

Introduction

Thank you for choosing 945GCD-M motherboard of great performance and with enhanced function. This motherboard has onboard Intel® Dual Core Atom™ CPU with a Micro-ATX form factor of 225 x 170 mm.

The motherboard incorporates the Intel 945GC Northbridge (NB) and ICH7 Southbridge (SB) chipsets. The Northbridge supports a Front Side Bus (FSB) frequency of 533 MHz using a scalable FSB Vcc_CPU. The memory controller supports DDR2 memory DIMM frequencies of 533. It supports two DDR2 socket with up to maximum memory of 4 GB. One PCI Express x16 slot, intended for Graphics Interface, is fully compliant to the PCI Express Gen1 (version 1.0a).

The ICH7 Southbridge supports one PCI slot which is PCI v2.3 compliant. In addition, one PCI Express x1 is supported. It implements an EHCI compliant interface that provides 480 Mb/s bandwidth for 8 USB 2.0 ports (4 USB ports and 2 USB 2.0 headers support additional 4 USB ports). The Southbridge integrates a Serial ATA host controller, supporting three SATA ports with maximum transfer rate up to 3.0 Gb/s each.

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including PS/2 mouse and keyboard connectors, one LPT port, one serial port, one VGA port, four USB ports, one LAN port and audio jacks for microphone, line-in and line-out.

Feature

Processor

This motherboard uses onboard Intel® Dual Core Atom™ CPU that carries the following features:

- Onboard Intel® Dual Core Atom™, 1.60GHz CPU speed with 1MB cache
- Supports a system bus (FSB) of 533 MHz
- Supports "Hyper-Threading" technology CPU

"Hyper-Threading" technology enables the operating system into thinking it's hooked up to two processors, allowing two threads to be run in parallel, both on separate "logical" processors within the same physical processor.

Chipset

The 945GC Northbridge (NB) and ICH7 Southbridge (SB) chipsets are based on an innovative and scalable architecture with proven reliability and performance.

945GC (NB)

- Supports 32-bit host bus addressing
- 2 GB/s point-to-point Direct Media Interface (DMI) to ICH7 (1 Gb/s each direction)
- Supports 256-Mb, 512-Mb and 1-Gb DDR2 technologies for x8 and x16 devices
- Supports high quality 3D setup, Render Engine and high-quality texture engine

ICH7 (SB)

- Enhanced DMA Controller, interrupt controller, and timer functions
- Compliant with PCI Express Base Specification, Revision 1.0a
- Compliant with PCI v2.3 specification
- Integrated SATA 3.0 Gb/s Host Controller
- Integrated USB 2.0 Host Controller supporting up to eight USB 2.0 ports
- Integrated IDE controller supports Ultra ATA 100/66/33

Memory

- Supports DDR2 533 DDR2 SDRAM
- Accommodates two unbuffered DIMMs
- Maximum memory size up to 4 GB

Audio

The onboard Audio provides the following features:

- 5.1 Channel High Definition Audio Codec
- Exceeds Microsoft Windows Logo Program (WLP) Requirements
- ADCs support 44.1K/48K/96K/192KHz sample rate
- Power Support: Digital: 3.3V; Analog: 5.0V

Onboard LAN

The onboard LAN controller provides either of the following features:

- Compliant with IEEE 802.3u for 10/100 Mbps ethernet, IEEE 802.3ab for 1000 Mbps ethernet
- PCI Express base 1.1 compliant
- Supports Wake-On-LAN (WOL) and AMD magic packet TM power management
- IEEE 802.3ab auto-negotiation support
- IEEE 802.3x compliant flow control support

Expansion Options

The motherboard comes with the following expansion options:

- One 32-bit PCI v2.3 compliant slot
- One PCI Express x16 slot for Graphics Interface
- One PCI Express x1 slots
- One IDE connector that supports two IDE devices
- Three 7-pin SATA connectors

The motherboard supports UDMA bus mastering with transfer rates of 133/100/66 Mb/s.

Integrated I/O

The motherboard has a full set of I/O ports and connectors:

- Two PS/2 ports for mouse and keyboard
- One LPT port
- One serial port
- One VGA port
- Four USB ports
- One LAN port
- Audio jacks for microphone, line-in and line-out

BIOS Firmware

This motherboard uses AMI BIOS that enables users to configure many system features including the following:

- Power management
- Wake-up alarms
- CPU parameters
- CPU and memory timing

The firmware can also be used to set parameters for different processor clock speeds.

1. Some hardware specifications and software items are subject to change without prior notice.

2. Due to chipset limitation, we recommend that motherboard be operated in the ambiance between 0 and 50 ° C.

3. To achieve better performance and air flow, we suggest that you use a system fan on this motherboard.

Motherboard Components

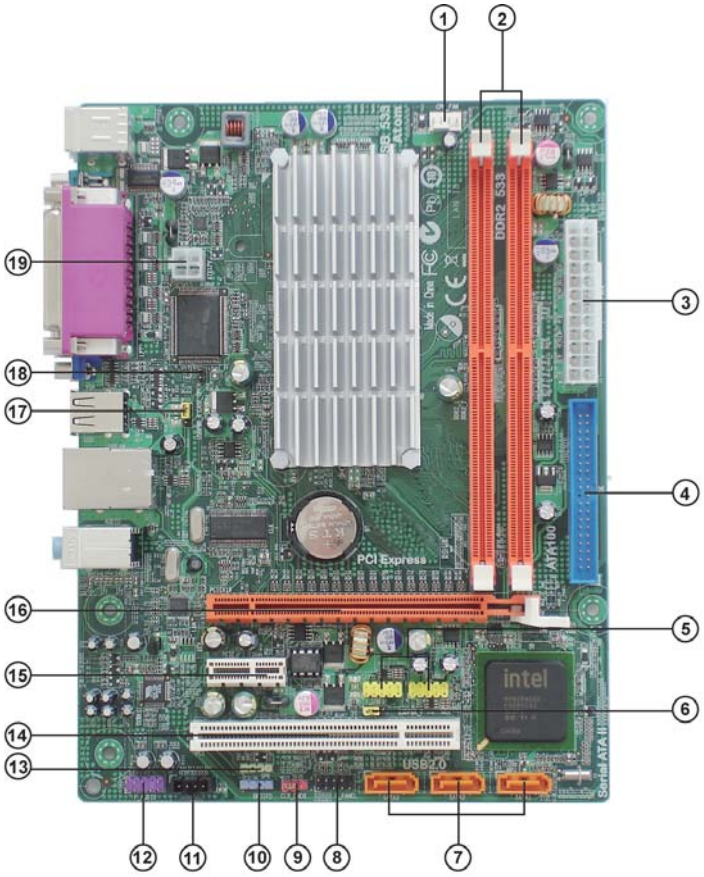


Table of Motherboard Components

LABEL	COMPONENTS
1. CPU_FAN	CPU cooling fan connector
2. DDR2_1~2	240-pin DDR2 SDRAM slots
3. ATX	Standard 24-pin ATX power connector
4. IDE	Primary IDE connector
5. F_USB1~2	Front panel USB headers
6. USBPWR_F	Front panel USB power select jumper
7. SATA1~3	Serial ATA connectors
8. F_PANEL	Front panel switch/LED header
9. CLR_CMOS	Clear CMOS jumper
10. SPDIFO	SPDIF out header
11. CD_IN	Analog audio input connector
12. F_AUDIO	Front panel audio header
13. SPK	Internal speaker header
14. PCI	32-bit add-on card slots
15. PCIE	PCI Express x1 slot
16. PCIE x16	PCI Express x16 graphics card slot
17. USBPWR_R	Rear USB/PS2 power select jumper
18. CASE_OPEN	Chassis detect header
19. ATX12V	4-pin +12V power connector

This concludes Chapter 1. The next chapter explains how to install the motherboard.

Memo

Chapter 2
Installing the Motherboard

Safety Precautions

- Follow these safety precautions when installing the motherboard
- Wear a grounding strap attached to a grounded device to avoid damage from static electricity
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard
- Leave components in the static-proof bags they came in
- Hold all circuit boards by the edges. Do not bend circuit boards

Choosing a Computer Case

There are many types of computer cases on the market. The motherboard complies with the specifications for the Micro-ATX system case. First, some features on the motherboard are implemented by cabling connectors on the motherboard to indicators and switches on the system case. Make sure that your case supports all the features required. Secondly, this motherboard supports two enhanced IDE drives. Make sure that your case has sufficient power and space for all drives that you intend to install.

Most cases have a choice of I/O templates in the rear panel. Make sure that the I/O template in the case matches the I/O ports installed on the rear edge of the motherboard.

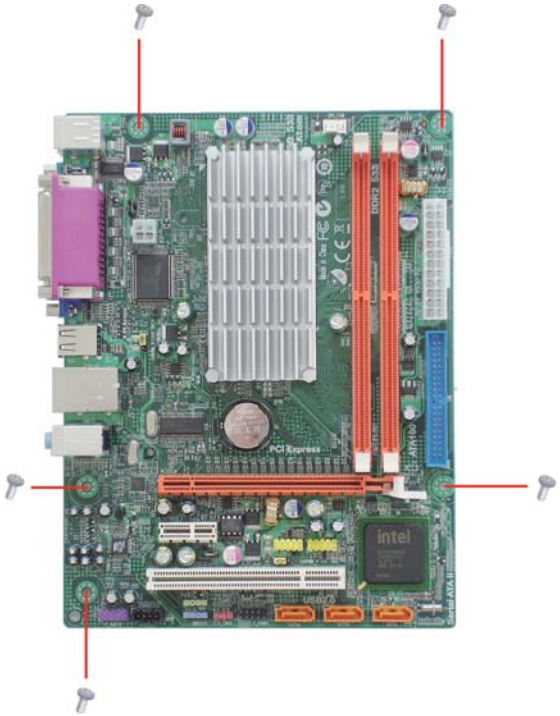
This motherboard carries a Micro-ATX form factor of 225 x 170 mm. Choose a case that accommodates this form factor.

Installing the Motherboard in a Case

Refer to the following illustration and instructions for installing the motherboard in a case.

Most system cases have mounting brackets installed in the case, which correspond the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.

Ensure that your case has an I/O template that supports the I/O ports and expansion slots on your motherboard.



Do not over-tighten the screws as this can stress the motherboard.

Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

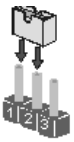
Setting Jumpers

Use the motherboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

The illustrations show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN.

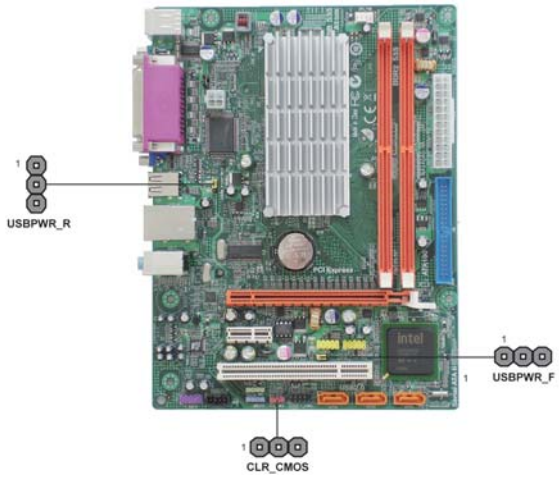
SHORT **OPEN**

This illustration shows a 3-pin jumper. Pins 1 and 2 are SHORT.



Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.



Jumper Settings

Jumper	Type	Description	Setting (default)	
CLR_CMOS	3-pin	CLEAR CMOS	1-2: NORMAL 2-3: CLEAR Before clearing the CMOS, make sure to turn the system off.	 1 **CLR_CMOS**
USBPWR_F	3-pin	Rear USB/PS2 Power Select Jumper	1-2: VCC5 2-3: VCC5_DUAL	 1 **USBPWR_F**
USBPWR_R	3-pin	Front Panel USB Power Select Jumper	1-2: VCC5 2-3: VCC5_DUAL	1 **USBPWR_R**

1. *To avoid the system instability after clearing CMOS, we recommend users to enter the main BIOS setting page to "Load Default Settings" and then "Save & Exit Setup".*
2. *Make sure the power supply provides enough VCC5_DUAL voltage before selecting the VCC5_DUAL function.*
3. *It is required that users place the USBPWR_F & USBPWR_R cap onto 2-3 pin rather than 1-2 pin as default if you want to wake up the computer by USB/PS2 KB/Mouse.*

Installing Hardware

Installing Memory Modules

This motherboard accommodates two memory module. It can support two 240-pin DDR2 533. The total memory capacity is 4 GB.

DDR2 SDRAM memory module table

Memory module	Memory Bus
DDR2 533	*266 MHz*

Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.

Installation Procedure

Refer to the following to install the memory modules.

1. This motherboard supports unbuffered DDR2 SDRAM .
2. Push the latches on each side of the DIMM slot down.
3. Align the memory module with the slot. The DIMM slots are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
4. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.
5. Install the DIMM module into the slot and press it firmly down until it seats correctly. The slot latches are levered upwards and latch on to the edges of the DIMM.

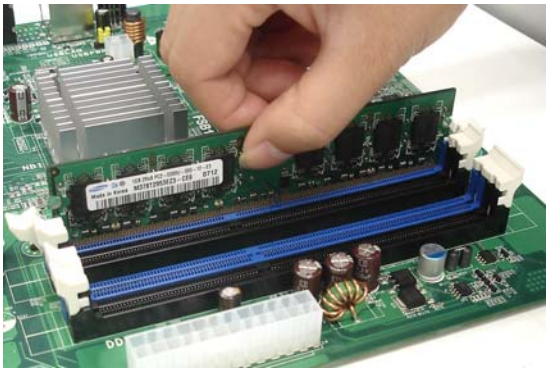


Table A: DDR2 (memory module) QVL (Qualified Vendor List)

The following DDR2 1066/800/667/533 memory modules have been tested and qualified for use with this motherboard.

Type	Size	Vendor	Module Name
DDR2 533	512 MB	Samsung	PC2-4200U-4444-10-B1
	1 GB	A-data	Vitesta
		Kingmax	KLBD48F-A8KE4
DDR2 667	512 MB	Apacer	78.91G92.9K5
		Micron	MT4HTF6464AY-667E1
		PSC	AL6E8E63J-6E1
		Ramxel	RML1520M38D6F-667
		Samsung	PC2-5300U-555-12-D3
		Sync MAX	04400WB01 R050008A
		Transcend	JetRam J12Q3AB-6
	1 GB	Apacer	AU01GE667C5KBGC
			AM4B5708GQJS7E0631F
			78.01G9O.9K5
		Corsair	VS1GB667D2
		Hexon	HYNT7AUDR-30M48
		Kingston	KVR667D2N5
		Micron	MT8HTF12864AY-667E1
		PSC	AL7E8E63B-6E1T
			AL7E8F63J-6E1
			AL7E8F73C-6E1
		Samsung	GOLD BAR M378T2863DZS 0742
	2 GB	Aeneon	AET860UD00-30DB08X
		Apacer	78.A1G9O.9K4
		Hexon	HYNT8AUDR-30M88
		Hynix	HYMP125U64AP8-Y5 AB-A 0623
		Kingston	KVR667D2N5/2G
		LeadMax	PC2-5300U
		PSC	AL8E8F73C-6E1
		Qimonda	HYS64T256020EU-3S-C2
	4 GB	Aeneon	AET960UD00-30D

Type	Size	Vendor	Module Name
DDR2 800	512 MB	Kingston	KVR800D2N5/512 1.8V 9905315-019.A02LF
		Micron	MT8HTF6464AY-80ED4
		Qimonda	HYS72T64000HU-2.5-B
	1 GB	A-DATA	M2GVD6G3I41P0U1E5E
		Aeneon	AET760UD00-30DB97X
			AET760UD00-25DC08X
		Apacer	AU01GE800C5KBGC
			78.01GAO.9K5
			78.01GA0.9L5
		APOGEE	AU1G082-800P000
		Geil	Geil Millenary
		Hexon	ELPT7AUDR-25M48
		Hynix	HYMP112U64CP8-S6 AB
		Infinity	04701G16CZ5U2G
			04701G16CY5U2A
		KingMax	KLDD48F-B8KU5 NGES
		Kingston	KVR800D2N5/1G 1.8V 9905316-054.A01LF
		Nanya	NT1GT64U88D0BY-AD
		Ramaxel	RML1320EH38D7F-800
		Samsung	GOLD BAR M378T2953EZ3-CE7 0726
			M378T2863EHS-CF7 0849
		Silicon Power	SP001GBLRU800S01
		Transcend	507301-1571
		Unifosa	GU341G0ALEPR6B2C6CE

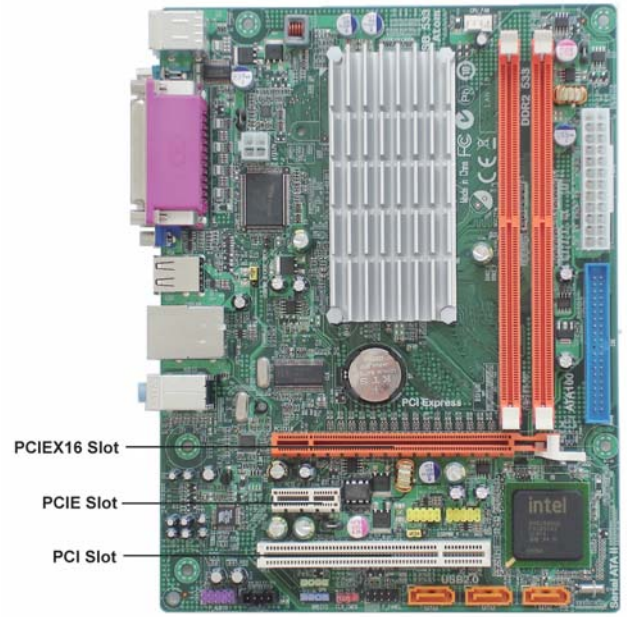
Type	Size	Vendor	Module Name
DDR2 800	2 GB	A-DATA	Red A-DATA M2OMI6H3J4720L1C5Z
		Aeneon	AET860UD00-25DC08X
		Apacer	78.A1GAO.9K4
			78.A1GC0.9L4
		CORSAIR	CM2X2048-6400C5
		Geil	Geil Platinum Edition
		Hexon	ELPT8AUDR-25M88
		Hynix	HYMP125U64CP8-S6 AB
		Kingston	KVR800D2N5/2G
			KVR800D2N6/2G-SP
		KingMax	KLDE88F-B8KU5 NHES
		Micron	MT16HTF25664AY-800E1
			MT16HTF25664AY-800E1
		Nanya	NT2GT64U8HD0BY-AD
		PSC	AL8E8F73C-8E1
			AL8E8G73F-8E1
		Qimonda	HYS64T256020EU-25F-C2
		Samsung	M378T5663QZ3-CF7
			M378T5663EH3-CF7
		SiliconPower	SP002GBLRU800S01
		Unifosa	GU342G0ALEPR692C6CE
DDR2 1600	1 GB	OCZ	OCZ2RPR 10662GK

Due to the motherboard limitation, the memory controller only supports DDR2 memory DIMM frequency of 533 MHz.

Expansion Slots

Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.



PCIE Slot The PCI Express x1 slots is fully compliant to the PCI Express Gen 1 (version 1.0a).

PCIEX16 Slot The PCI Express x16 slot is used to install an external PCI Express graphics card that is fully compliant to the PCI Express Gen 1 (version 1.0a).

PCI Slot This motherboard is equipped with one standard PCI slot. PCI stands for Peripheral Component Interconnect and is a bus standard for expansion cards, which for the most part, is a supplement of the older ISA bus standard. The PCI slot on this board is PCI v2.3 compliant.

Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Follow these instructions to install an add-on card:

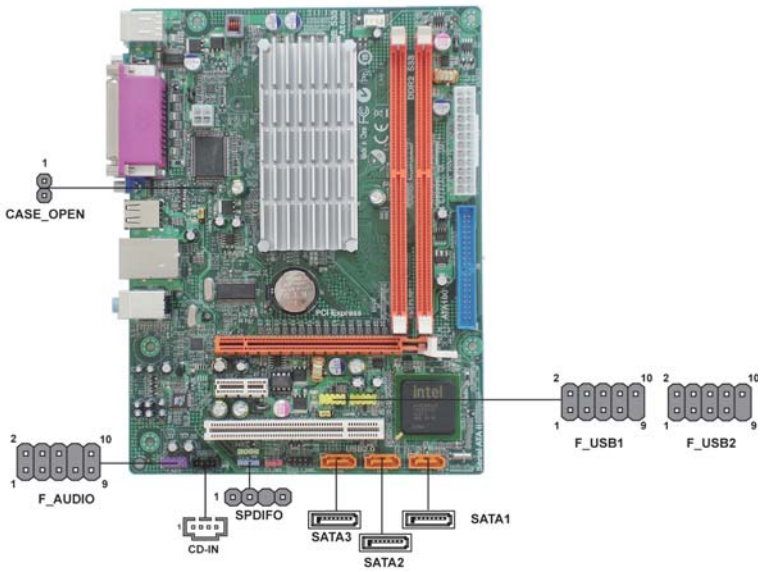
1 Remove a blanking plate from the system case corresponding to the slot you are going to use.
2 Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
3 Secure the metal bracket of the card to the system case with a screw.

1. For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.

2. The onboard PCI interface does not support 64-bit SCSI cards.

Connecting Optional Devices

Refer to the following for information on connecting the motherboard's optional devices:



F_AUDIO: Front Panel Audio header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal Name	Pin	Signal Name
1	PORT 1L	2	AUD_GND
3	PORT 1R	4	PRESENCE#
5	PORT 2R	6	SENSE1_RETURN
7	SENSE_SEND	8	KEY
9	PORT 2L	10	SENSE2_RETURN

SATA1~3: Serial ATA connectors

These connectors are use to support the new Serial ATA devices for the highest date transfer rates (3.0 Gb/s), simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.

Pin	Signal Name	Pin	Signal Name
1	Ground	2	TX+
3	TX-	4	Ground
5	RX-	6	RX+
7	Ground	-	-

F_USB1~2: Front Panel USB headers

The motherboard has four USB ports installed on the rear edge I/O port array. Additionally, some computer cases have USB ports at the front of the case. If you have this kind of case, use auxiliary USB connector to connect the front-mounted ports to the motherboard.

Pin	Signal Name	Function
1	USBPWR	Front Panel USB Power
2	USBPWR	Front Panel USB Power
3	USB_FP_P0-	USB Port 0 Negative Signal
4	USB_FP_P1-	USB Port 1 Negative Signal
5	USB_FP_P0+	USB Port 0 Positive Signal
6	USB_FP_P1+	USB Port 1 Positive Signal
7	GND	Ground
8	GND	Ground
9	Key	No pin
10	USB_FP_OC0	Overcurrent signal

Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

SPDIFO: SPDIF out header

This is an optional header that provides an S/PDIF (Sony/Philips Digital Interface) output to digital multimedia device through optical fiber or coaxial connector.

Pin	Signal Name	Function
1	SPDIF	SPDIF digital output
2	+5VA	5V analog Power
3	Key	No pin
4	GND	Ground

F_AUDIO: Front Panel Audio header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal Name	Pin	Signal Name
1	PORT 1L	2	AUD_GND
3	PORT 1R	4	PRESENCE#
5	PORT 2R	6	SENSE1_RETURN
7	SENSE_SEND	8	KEY
9	PORT 2L	10	SENSE2_RETURN

Installing a Hard Disk Drive/CD-ROM/SATA Hard Drive

This section describes how to install IDE devices such as a hard disk drive and a CD-ROM drive.

About IDE Devices

Your motherboard has one IDE channel interface. An IDE ribbon cable supporting two IDE devices is bundled with the motherboard.

You must orient the cable connector so that the pin1 (color) edge of the cable corresponds to the pin 1 of the I/O port connector.

IDE: IDE Connector

This motherboard supports three high data transfer SATA ports with each runs up to 3.0 Gb/s. To get better system performance, we recommend users connect the CD-ROM to the IDE channel, and set up the hard dives on the SATA ports.

IDE devices enclose jumpers or switches used to set the IDE device as MASTER or SLAVE. Refer to the IDE device user's manual. Installing two IDE devices on one cable, ensure that one device is set to MASTER and the other device is set to SLAVE. The documentation of your IDE device explains how to do this.

About SATA Connectors

Your motherboard features three SATA connectors supporting a total of two drives. SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. This SATA cable comes with one SATA power cable. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.

SATA cable (optional)

SATA power cable (optional)

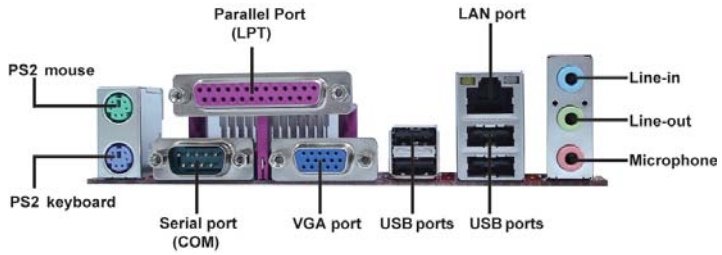
Refer to the illustration below for proper installation:

1 Attach either cable end to the connector on the motherboard.
2 Attach the other cable end to the SATA hard drive.
3 Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.

This motherboard supports the "Hot-Plug" function.

Connecting I/O Devices

The backplane of the motherboard has the following I/O ports:



PS2 Mouse — Use the upper PS/2 port to connect a PS/2 pointing device.

PS2 Keyboard — Use the lower PS/2 port to connect a PS/2 keyboard.

Parallel Port (LPT) — Use LPT to connect printers or other parallel communications devices.

Serial Port (COM) — Use the COM port to connect serial devices such as mouse or fax/modems.

VGA Port — Connect your monitor to the VGA port.

USB Ports — Use the USB ports to connect USB devices.

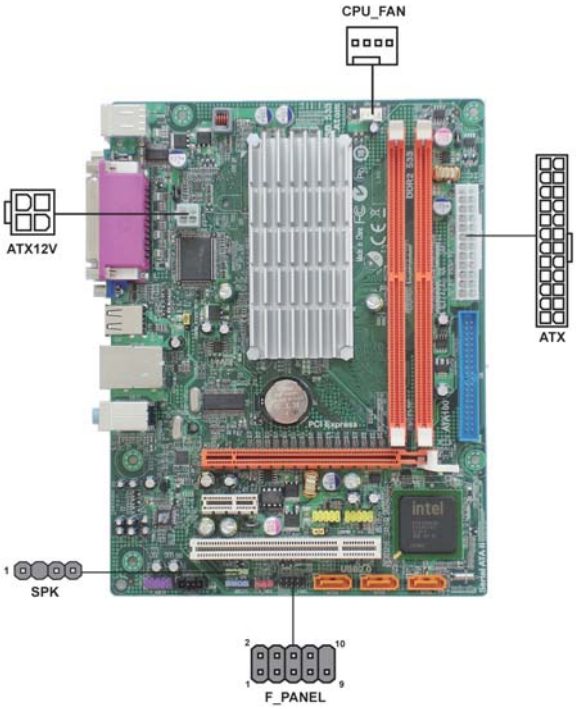
LAN Port — Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

Audio Ports — Use the three audio ports to connect audio devices. The first jack is for stereo line-in signal. The second jack is for stereo line-out signal. The third jack is for microphone.

Connecting Case Components

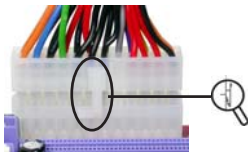
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:

1 Connect the auxiliary case power supply connector to **ATX12V**.
2 Connect the case switches and indicator LEDs to the **F_PANEL**.
3 Connect the standard power supply connector to **ATX**.
4 Connect the case speaker cable to **SPK**.



Connecting 24-pin power cable

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.

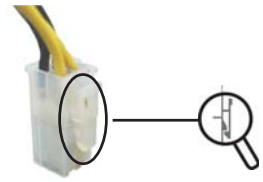


24-pin power cable

With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX match perfectly.

Connecting 4-pin power cable

The ATX12V1 power connector is used to provide power to the CPU.



When installing 4-pin power cable, the latches of power cable and the ATX12V match perfectly.

4-pin power cable

CPU_FAN: FAN Power Connectors

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor
4	Control	CPU FAN control

1.Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

2.Users please note that this connector can be used as CASE_FAN for quiet operation.

ATX: ATX 24-pin Power Connector

Pin	Signal Name	Pin	Signal Name
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS_ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	PWRGD	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

ATX12V: ATX 12V Power Connector

Pin	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

SPK: Internal speaker

Pin	Signal Name
1	VCC
2	Key
3	NC
4	Signal

Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases. Refer to the table below for information:

F_PANEL

Pin	Signal	Function	Pin	Signal	Function
1	HD_LED_P	Hard disk LED(+)	2	FP PWR/SLP	*MSG LED(+)
3	HD_LED_N	Hard disk LED(-)	4	FP PWR/SLP	*MSG LED(-)
5	RST_SW_N	Reset Switch(-)	6	PWR_SW_P	Power Switch(+)
7	RST_SW_P	Reset Switch(+)	8	PWR_SW_N	Power Switch(-)
9	RSVD	Reserved	10	Key	No pin

***** *MSG LED (dual color or single color)*

Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3
Using BIOS

About the Setup Utility

The computer uses the latest "American Megatrends Inc." BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

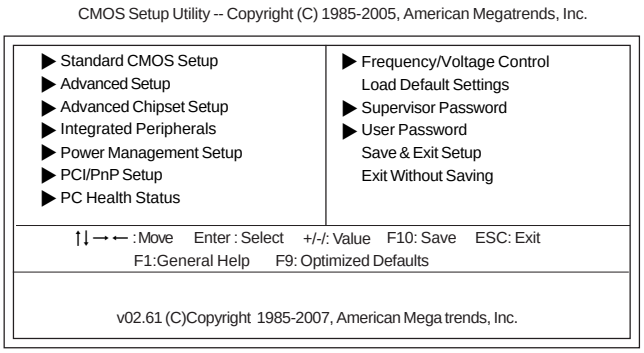
- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

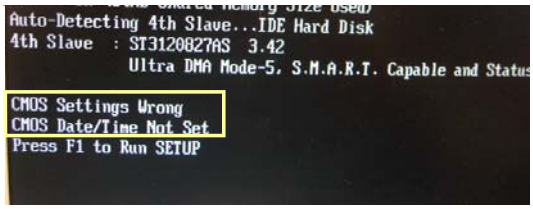
Press the delete key to access the BIOS Setup Utility.


CMOS Setup Utility -- Copyright (C) 1985-2005, American Megatrends, Inc.
▶ Standard CMOS Setup
▶ Advanced Setup
▶ Advanced Chipset Setup
▶ Integrated Peripherals
▶ Power Management Setup
▶ PCI/PnP Setup
▶ PC Health Status
▶ Frequency/Voltage Control
Load Default Settings
▶ Supervisor Password
▶ User Password
Save & Exit Setup
Exit Without Saving
↑↓→←:Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1:General Help F9: Optimized Defaults
v02.61 (C)Copyright 1985-2007, American Mega trends, Inc.

Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a “CMOS Settings Wrong” message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.


Auto-Detecting 4th Slave...IDE Hard Disk
4th Slave : ST3120827AS 3.42
Ultra DMA Mode-5, S.M.A.R.T. Capable and Status
CMOS Settings Wrong
CMOS Date/Time Not Set
Press F1 to Run SETUP

Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ▶.

The default BIOS setting for this motherboard applies for most conditions with optimum performance. It is not suggested to change the default values in the BIOS setup and the manufacture takes no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

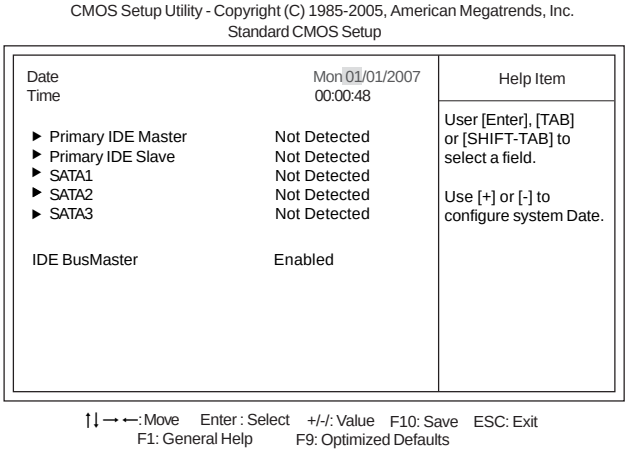
The BIOS navigation keys are listed below:

KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-	Modifies the selected field's values
Enter	Select
F9	Loads an optimized setting for better performance
F10	Saves the current configuration and exits setup
F1	Displays a screen that describes all key functions

For the purpose of better product maintenance, the manufacture reserves the right to change the BIOS items presented in this manual. The BIOS setup screens shown in this chapter are for reference only and may differ from the actual BIOS. Please visit the manufacture's website for updated manual.

Standard CMOS Setup

This option displays basic information about your system.

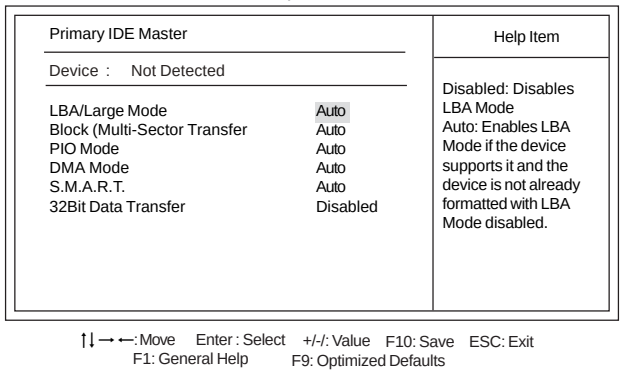


Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

► Primary IDE Master

Your computer has one IDE channel which can be installed with one or two devices (Master and Slave). In addition, this motherboard supports four SATA channels and each channel allows one SATA device to be installed. Use these items to configure each device on the IDE channel.



LBA/Large Mode (Auto)

Use this item to set the LAB/Large mode to enhance hard disk performance by optimizing the area the hard disk is visited each time.

Block (Multi-Sector Transfer (Auto)

If the feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode (Auto)

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode (Auto)

DMA capability allows user to improve the transfer-speed and data-integrity for compatible IDE devices.

S.M.A.R.T. (Auto)

The S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. software resides on both the disk drive and the host computer.

32Bit Data Transfer (Disabled)

Use this item to enable the 32Bit Data Transfer.

Press <Esc> to return to the Standard CMOS Setup page.

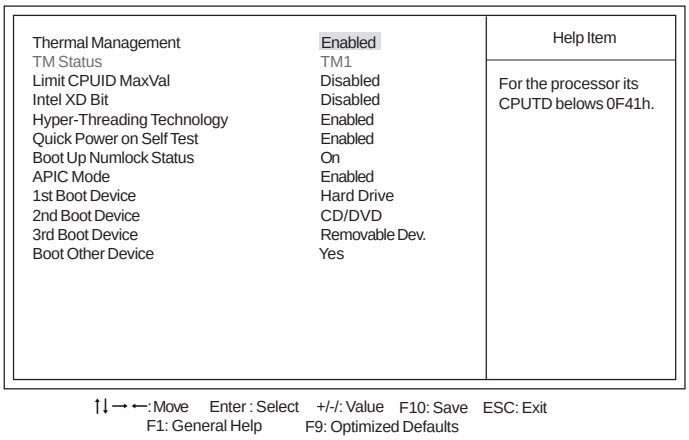
IDE BusMaster (Enabled)

This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

Press <Esc> to return to the main menu setting page.

Advanced Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.



Thermal Management/TM Status (Enabled/TM1)

These items display CPU's temperature and enable you to set a safe temperature to Prescott CPU.

Limit CPUID MaxVal (Disabled)

This item can support Prescott CPUs for old OS. Users please note that under NT 4.0, it must be set "Enabled", while under WinXP, it must be set "Disabled".

Intel XD Bit (Disabled)

This item allows users to enable or disable the Intel XD bit.

Hyper-Threading Technology (Enabled)

This item is only available when the chipset supports Hyper-Threading and you areusing a Hyper-Threading CPU.

Quick Power on Self Test (Enabled)

Enable this item to shorten the power on testing (POST) and have your system start up faster. You might like to enable this item after you are confident that your system hardware is operating smoothly.

Boot Up Numlock Status (On)

This item defines if the keyboard Num Lock key is active when your system is started.

APIC Mode (Enabled)

This item allows you to enable or disable the APCI (Advanced Programmable Interrupt Controller) mode. APIC provides symmetric multi-processing (SMP) for systems, allowing support for up to 60 processors.

1st/2nd/3rd Boot Device (Hard Drive/CD/DVD/Removable Dev.)

Use this item to determine the device order the computer used to look for an operating system to load at start-up time. The devices showed here will be different depending on the exact devices installed on your motherboard.

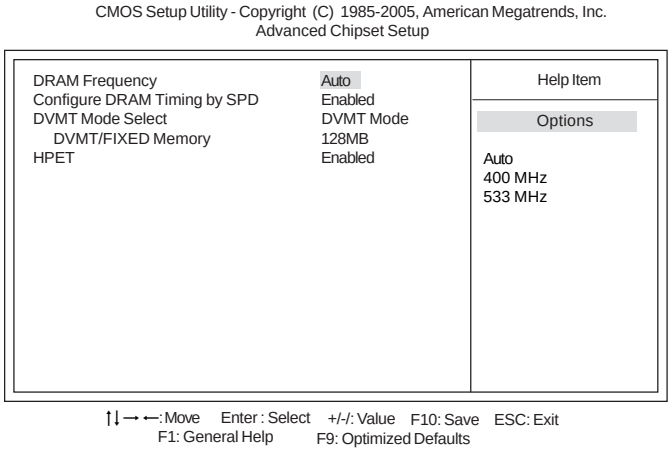
Boot Other Device (Yes)

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the First, Second and Third boot devices.

Press <Esc> to return to the main menu setting page.

Advanced Chipset Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.



DRAM Frequency (Auto)

This item enables users to adjust the DRAM frequency. The default setting is auto and we recommend users leave the setting unchanged. Modify it at will may cause the system to be unstable.

Configure DRAM Timing by SPD (Enabled)

When this item is set to enable, the DDR timing is configured using SPD. SPD (Serial Presence Detect) is located on the memory modules, BIOS reads information coded in SPD during system boot up.

DVMT Mode Select (DVMT Mode)

When set to Fixed Mode, the graphics driver will reserve a fixed portion of the system memory as graphics memory, according to system and graphics requirements.

DVMT/FIXED Memory (128MB)

This item allows you to remap the overlapped PCI memory above the total physical memory if you have a 64 bit OS and 8 GB of RAM.

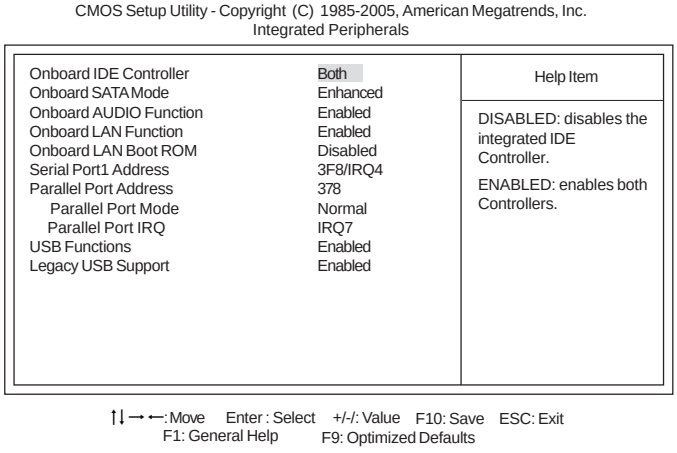
HPET (Enabled)

This item enables or disables HPET (High Precision Event Timer) support.

Press <Esc> to return to the main menu setting page.

Integrated Peripherals

This page sets up some parameters for peripheral devices connected to the system.



Onboard IDE Controller (Both)

Use this item to enable or disable the onboard IDE interface.

Onboard SATA Mode (Enhanced)

Use this item to select the mode of the Serial ATA.

Onboard AUDIO Function (Enabled)

Use this item to enable or disable the onboard Audio function.

Onboard LAN Function (Enabled)

Use this item to enable or disable the onboard LAN function.

Onboard LAN BOOT ROM (Disabled)

Use this item to enable or disable the booting from the onboard LAN or a network add-in card with a remote boot ROM installed.

Serial Port1 Address (3F8/IRQ4)

Use this item to enable or disable the onboard COM1/2 serial port, and to assign a port address.

Parallel Port Address (378)

Use this item to enable or disable the onboard Parallel port, and to assign a port address.

Parallel Port Mode (Normal)

Use this item to select the parallel port mode. You can select Normal (Standard Parallel Port), ECP (Extended Capabilities Port), EPP (Enhanced Parallel Port), or BPP (Bi-Directional Parallel Port).

Parallel Port IRQ (IRQ7)

Use this item to assign IRQ to the parallel port.

USB Functions (Enabled)

Use this item to enable or disable the USB function.

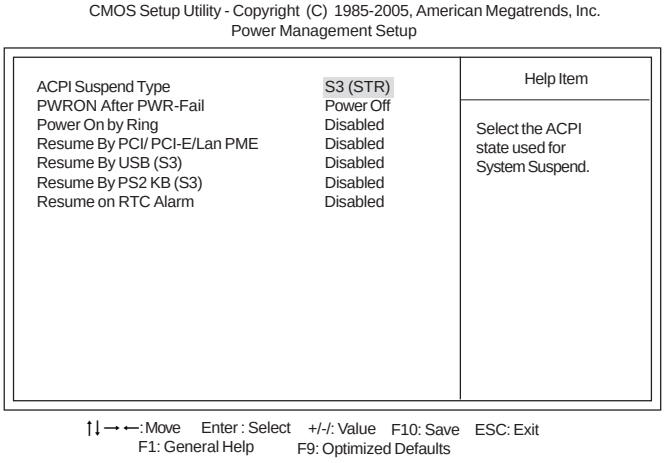
Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB devices. Setting to Auto allows the system to detect the presence of USB device at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

Press <Esc> to return to the main menu setting page.

Power Management Setup

This page sets up some parameters for system power management operation.



ACPI Suspend Type (S3(STR))

Use this item to define how your system suspends. In the default, S3, the suspend mode is a suspend to RAM, i.e, the system shuts down with the exception of a refresh current to the system memory.

PWRON After PWR-Fail (Power Off)

This item enables your computer to automatically restart or return to its operating status.

Power On by Ring (Disabled)

The system can be turned off with a software command. If you enable this item, thesystem can automatically resume if there is an incoming call on the Modem. Youmust use an ATX power supply in order to use this feature.

Resume By PCI/PCI-E/Lan PME (Disabled)

These items specify whether the system will be awakened from power saving modeswhen activity or input signal of the specified hardware peripheral or component isdetected.

Resume By USB (S3) (Disabled)

This item allows users to enable or disable the USB device Walk-up from S3 mode.

Resume By PS2 KB (S3) (Disabled)

Use this item to allow keyboard activity to awaken the system from power saving mode.

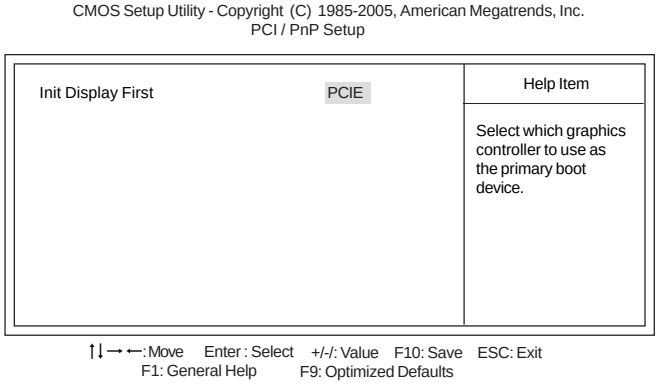
Resume on RTC Alarm (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system's RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

Press <Esc> to return to the main menu setting page.

PCI / PnP Setup

This page sets up some parameters for devices installed on the PCI bus and those utilizing the system plug and play capability.



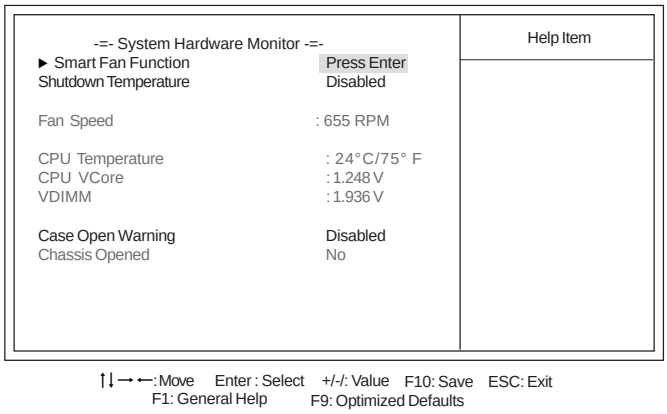
Init Display First (PCIE)

Use this item to select which graphics controller to use as the primary boot devices.

Press <Esc> to return to the main menu setting page.

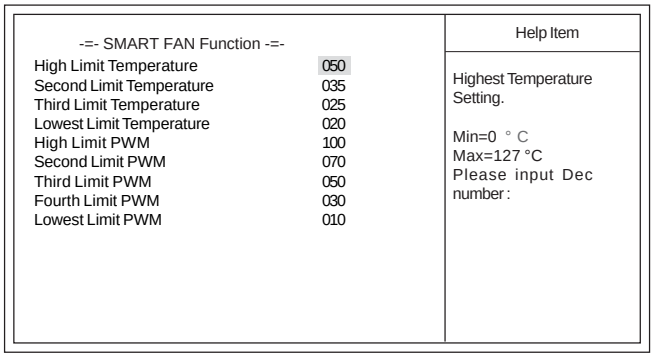
PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



▶ Smart Fan Function

Scroll to this item and press <Enter> to view the following screen:



Press <Esc> to return to the PC Health Status page.

Shutdown Temperature (Disabled)

Enable you to set the maximum temperature the system can reach before powering down.

System Component Characteristics

These items display the monitoring of the overall inboard hardware health events, such as System & CPU temperature, CPU & DIMM voltage, CPU & system fan speed,...etc.

- Fan Speed
- CPU Temperature
- CPU Vcore
- VDIMM

Press <Esc> to return to the main menu setting page.

Case Open Warning (Disabled)

This item enables or disables the warning if the case is opened up, and the itembelow indicates the current status of the case.

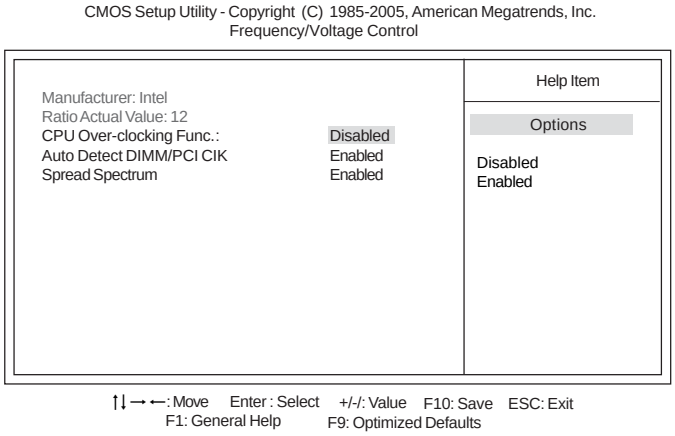
Chassis Opened (No)

This item indicates whether the case has been opened.

Press <Esc> to return to the main menu setting page.

Frequency/Voltage Control

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Frequency/Voltage Control
Help Item
Manufacturer: Intel
Ratio Actual Value: 12
CPU Over-clocking Func.: Disabled
Auto Detect DIMM/PCI CIK Enabled
Spread Spectrum Enabled
Options
Disabled
Enabled
↑↓→←: Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Manufacturer (Intel)

This item displays the information of current manufacturer of the CPU installed in your computor.

Ratio Actual Value (12)

This item shows the actual ratio of the CPU installed in your System.

CPU Over-clocking Func. (Disabled)

This item decides the CPU over-clocking function/frequencyinstalled in your system. If the over-clocking fails, please turn offthe system power. And then, hold the PageUp key (similar to theClear CMOS function) and turn on the power, the BIOS willrecover the safe default.

Auto Detect DIMM/PCI Clk (Enabled)

When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

Spread Spectrum (Enabled)

If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

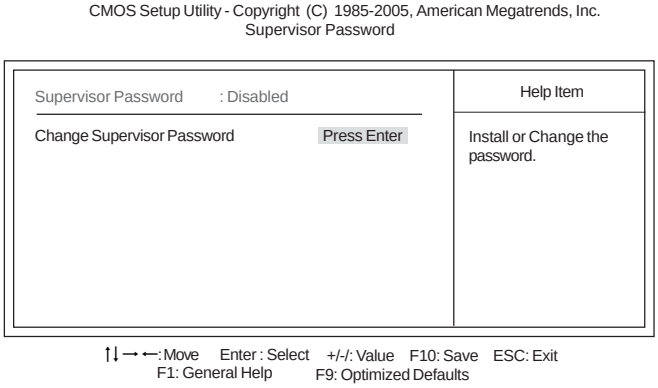
Press <Esc> to return to the main menu setting page.

Load Default Settings

This option opens a dialog box to ask if you are sure to install optimized defaults or not. You select [OK], and then <Enter>, the Setup Utility loads all default values; or select [Cancel], and then <Enter>, the Setup Utility does not load default values.

Supervisor Password

This page helps you install or change a password.



Supervisor Password (Disabled)

This item indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

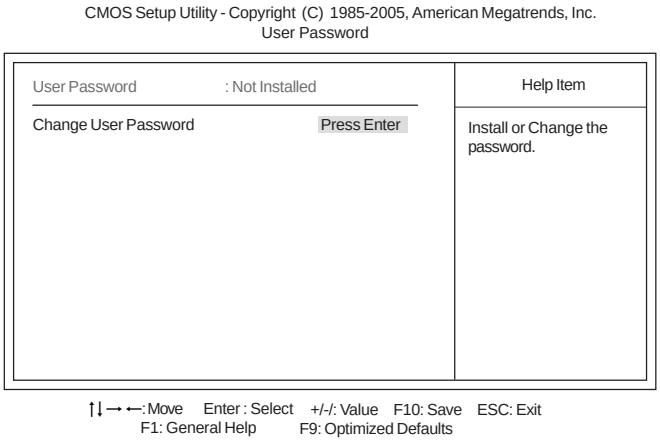
Change Supervisor Password (Press Enter)

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

Press <Esc> to return to the main menu setting page.

User Password

This page helps you install or change a password.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
User Password
User Password : Not Installed
Change User Password Press Enter
Help Item
Install or Change the password.
↑↓→←: Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

User Password (Not Installed)

This item indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

Change User Password (Press Enter)

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

Press <Esc> to return to the main menu setting page.

Save & Exit Setup

Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility and exit the Setup Utility. When the Save and Exit dialog box appears, select [OK] to save and exit, or select [Cancel] to return to the main menu.

Exit Without Saving

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility. When the Exit Without Saving dialog box appears, select [OK] to discard changes and exit, or select [Cancel] to return to the main menu.

If you have made settings that you do not want to save, use the "Exit Without Saving" *item and select [OK] to discard any changes you have made.*

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Web site. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

1. If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.
2. If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)
3. Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)
4. Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.
5. Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)
6. At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AMINF340.EXE040706.ROM
7. When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Memo

Chapter 4
Using the Motherboard Software

About the Software CD-ROM

The support software CD-ROM that is included in the motherboard package contains all the drivers and utility programs needed to properly run the bundled products. Below you can find a brief description of each software program, and the location for your motherboard version. More information on some programs is available in a README file, located in the same directory as the software. Before installing any software, always inspect the folder for files named README.TXT, INSTALL.TXT, or something similar. These files may contain important information that is not included in this manual.

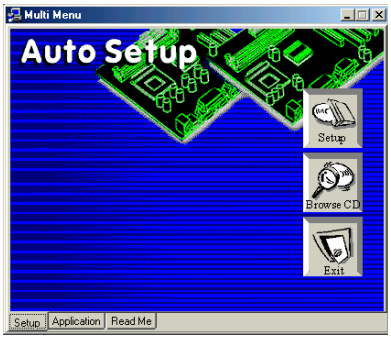
1. *Never try to install all software from folder that is not specified for use with your motherboard.*
2. *The notice of Intel HD audio installation (optional): The Intel High Definition audio functionality unexpectedly quits working in Windows Server 2003 Service Pack 1 or Windows XP Professional x64 Edition. Users need to download and install the update packages from the Microsoft Download Center "before" installing HD audio driver bundled in the Driver CD. Please log on to http://support.microsoft.com/default.aspx?scid=kb;en-us;901105#appliesto for more information.*

Auto-installing under Windows Vista

The Auto-install CD-ROM makes it easy for you to install the drivers and software for your motherboard.

If the Auto-install CD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Refer to the Utility Folder Installation Notes later in this chapter.

The support software CD-ROM disc loads automatically under Windows Vista. When you insert the CD-ROM disc in the CD-ROM drive, the autorun feature will automatically bring up the install screen. The screen has three buttons on it, Setup, Browse CD and Exit.



If the opening screen does not appear; double-click the file "setup.exe" in the root directory.

Setup Tab

Setup	Click the **Setup** button to run the software installation program. Select from the menu which software you want to install.
Browse CD	The **Browse CD** button is the standard Windows command that allows you to open Windows Explorer and show the contents of the support CD. Before installing the software from Windows Explorer, look for a file named README.TXT, INSTALL.TXT or something similar. This file may contain important information to help you install the software correctly. Some software is installed in separate folders for different operating systems, such as Windows Vista. Always go to the correct folder for the kind of OS you are using. In install the software, execute a file named SETUP.EXE or INSTALL.EXE by double-clicking the file and then following the instructions on the screen.
Exit	The **EXIT** button closes the Auto Setup window.

Application Tab

Lists the software utilities that are available on the CD.

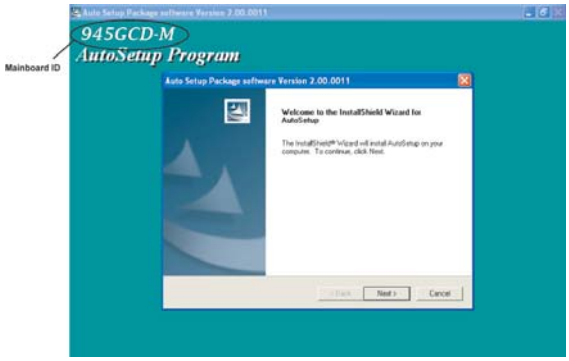
Read Me Tab

Displays the path for all software and drivers available on the CD.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

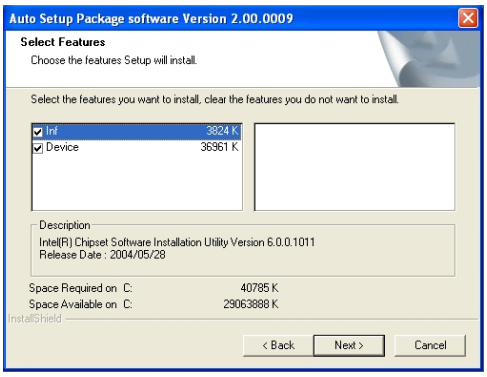
1. *Click **Setup.** The installation program begins:*



The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

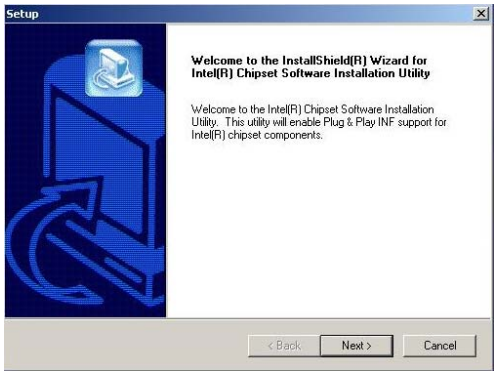
The motherboard identification is located in the upper left-hand corner.

2. *Click **Next.** The following screen appears:*


Auto Setup Package software Version 2.00.0009
Select Features
Choose the features Setup will install.
Select the features you want to install, clear the features you do not want to install.
Inf 3824 K
Device 36961 K
Description
Intel(R) Chipset Software Installation Utility Version 6.0.0.1011
Release Date : 2004/05/28
Space Required on C: 40785 K
Space Available on C: 29063888 K
InstallShield
< Back
Next >
Cancel

3. *Check the box next to the items you want to install. The default options are recommended.*

4. *Click **Next** run the Installation Wizard. An item installation screen appears:*


Setup
Welcome to the InstallShield(R) Wizard for Intel(R) Chipset Software Installation Utility
Welcome to the Intel(R) Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel(R) chipset components.
< Back
Next >
Cancel

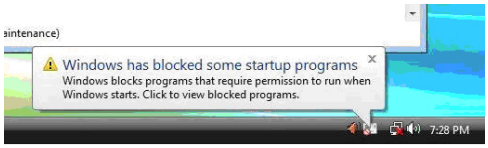
5. *Follow the instructions on the screen to install the items.*

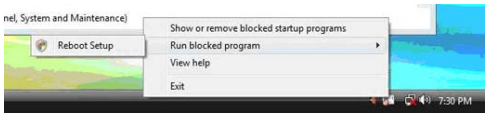
1. Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to restart a few times to complete the installation.

2. During the Windows Vista Driver Auto Setup Procedure, users should use one of the following two methods to install the driver after the system restart.

Method 1. Run Reboot Setup

Windows Vista will block startup programs by default when installing drivers after the system restart. You must select taskbar icon **Run Blocked Program** and run **Reboot Setup** to install the next driver, until you finish all drivers installation.


Windows has blocked some startup programs
Windows blocks programs that require permission to run when Windows starts. Click to view blocked programs.
7:28 PM



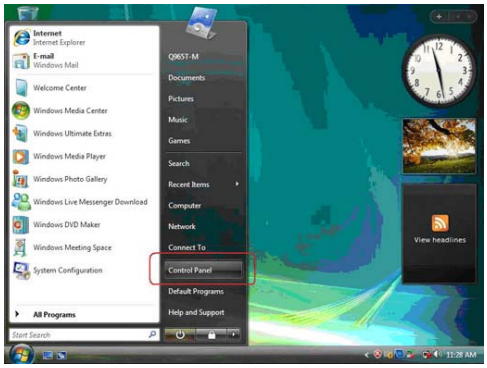
Method 2. Disable UAC (User Account Control)

* For administrator account only. Standard user account can only use Method 1.

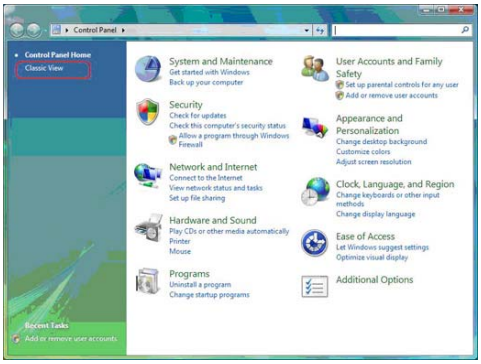
Disable Vista UAC function before installing drivers, then use CD driver to install drivers, it will continue to install drivers after system restart without running blocked programs.

Follow these instructions to Disable Vista UAC function:

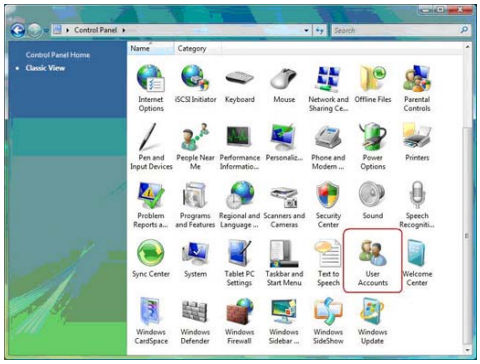
1. *Go to* ***Control Panel****.*



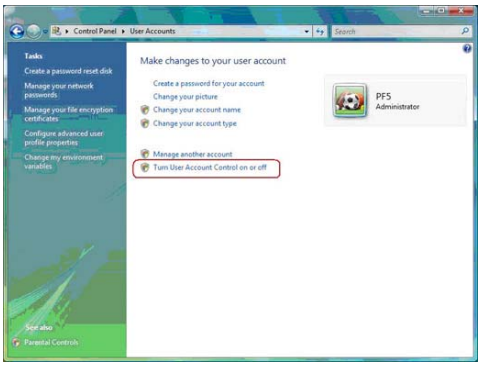
2. *Select* ***Classic View****.*



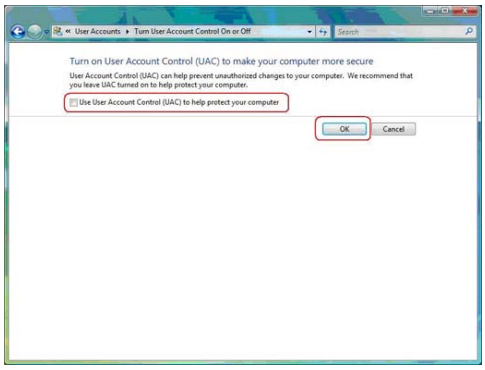
3. *Set* ***User Account****.*



4. *Select* ***Turn User Account Control on or off*** *and press* ***Continue****.*



*5. Disable **User Account Control (UAC) to help protect your computer** item and press **OK**, then press **Restart Now**. Then you can restart your computer and continue to install drivers without running blocked programs.*


User Accounts ▸ Turn User Account Control On or Off
Search
Turn on User Account Control (UAC) to make your computer more secure
User Account Control (UAC) can help prevent unauthorized changes to your computer. We recommend that you leave UAC turned on to help protect your computer.
Use User Account Control (UAC) to help protect your computer
OK
Cancel

Manual Installation

Insert the CD in the CD-ROM drive and locate the PATH.DOC file in the root directory. This file contains the information needed to locate the drivers for your motherboard.

Look for the chipset and motherboard model; then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.

These software(s) are subject to change at anytime without prior notice. Please refer to the support CD for available software.

This concludes Chapter 4.